

REMARKS

This Amendment is submitted in reply to the non-final Office Action mailed on September 4, 2007. No fee is due in connection with this Amendment. The Director is authorized to charge any fees which may be required, or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 112701-587 on the account statement.

Claims 1, 3-6 and 8-17 are pending in this application. Claims 13-17 were previously withdrawn. Claims 2 and 7 were previously canceled. In the Office Action, Claim 6 was objected to. Claims 1 and 3 are rejected under 35 U.S.C. § 112. Claims 1, 3-6 and 8-12 are rejected under 35 U.S.C. §103. In response, Claim 4 has been canceled and Claims 1, 3 and 5-6 have been amended. In view of the amendment and/or for the reasons set forth below, Applicants respectfully submit that the rejections should be withdrawn.

In the Office Action, Claim 6 was objected to for reasons of informality. In response, Applicants have amended independent Claim 6 per the suggestions of the Patent Office. Accordingly, Applicants respectfully request that the objection of Claim 6 be withdrawn.

In the Office Action, Claims 1 and 3 are rejected under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Specifically, the Patent Office asserts that Claim 1 is indefinite in failing to recite what is intended by “significant” hydrolysis and by “improved” transparency. The Patent Office further alleges that Claim 1 is indefinite in not reciting to what “the water content” refers and allegedly because there is no antecedent basis in Claim 1 for “cooking.” Further, the Patent Office alleged that Claim 3 is indefinite for not reciting when and to what the vacuum is applied.

Appellants respectfully disagree with the Patent Office’s assertion that Claim 1 is indefinite for failing to recite what is intended by “significant” hydrolysis and by “improved transparency.” Instead, Applicants respectfully submit that one of ordinary skill in the art would appreciate the meaning of “significant” hydrolysis and “improved transparency” as required, in part, by independent Claim 1. The specification includes a detailed description about the complications involved in the processing of hard candies where hydrolysis of the sugar alcohol occurs. For example, and as described in the specification, when significant hydrolysis of the sugar alcohol occurs, the resulting candy product is a sticky and hygroscopic product.

Significant hydrolysis of the sugar alcohol may also result in the crystallization of the product. In turn, the sticky, hygroscopic nature of the candy and/or the crystallization of the product results in a tendency of the hard candy to be opaque. See, specification, page 1, line 20-page 2, line 2. This is not always a desirable property of a hard candy, and it may often be desirable for aesthetic reasons for a hard candy to be as transparent as possible.

As described in the specification, Applicants have surprisingly found that the transparency of a hard candy may be improved by the addition acidic component(s), which have conventionally been found to hydrolyze the sugar alcohol, from the start of the process for the manufacture of hard candy provided that conditions are used in the process under which the acid does not significantly hydrolyze the sugar alcohol. See, specification, page 4, lines 9-18. Applicants respectfully submit that one of ordinary skill in the art would immediately appreciate that significant hydrolysis of the sugar alcohol results in a sticky, hygroscopic hard candy product and/or an undesirable amount of crystallization of the hard candy product, and that the amount of hydrolysis of the sugar alcohols necessary to obtain such undesirable properties may be readily determined by the skilled artisan without any undue experimentation. For example, the skilled artisan would readily be able to determine when a hard candy product is too sticky, hygroscopic or crystallized to be used in the manufacture of a transparent hard candy. If these undesired properties occur during processing, the skilled artisan would easily be able to determine that "significant" hydrolysis of the sugar alcohols, as used herein by Applicants, has occurred. Moreover, the specification explicitly indicates certain wavelength measurements that should be recognized by the skilled artisan as being acceptable transparency measurements of a hard candy product produced without significant hydrolysis of the sugar alcohols, which are compared to a hard candy product that is produced via a process wherein significant hydrolysis may occur. See, specification, Examples 1 and 2; Table 1; Figure 3. Applicants respectfully submit that the skilled artisan would recognize that a hard candy produced by a process wherein significant hydrolysis of the sugar alcohols occurs would have a wavelength measurement outside of the desired wavelength measurements found by Applicants to result in a sufficiently transparent hard candy product.

Further, Applicants also respectfully disagree with the Patent Office's assertion that Claim 1 is indefinite for failing to recite what is intended by "improved" transparency. As described above, the specification compares two hard candy products, one made by a process in

accordance with the presently claimed subject matter wherein the acidic component(s) are added before a cooking step, and the other made by a process in which the acidic component(s) are added after a cooking step. As shown by Table 1 and Figure 3, the hard candy products made by a process in accordance with the presently claimed subject matter clearly result in “improved” transparency over the hard candy product made a process in which the acidic component(s) are added after a cooking step. As a result, Applicants respectfully submit that the skilled artisan would recognize that “improved” transparency, as used by Applicants in the specification, correlates to the higher transmission values of a hard candy product produced where in the acidic component(s) are added before cooking, as opposed to after cooking. Applicants respectfully submit that the specification clearly illustrates that the transmission values of the product made in Example 1 are clearly higher, or “improved,” when compared to the product made in Example 2.

In response to the Patent Office’s assertion that Claim 1 is indefinite for not reciting to what “the water content” refers, Applicants have amended independent Claim 1 to recite, in part, “wherein the water content of the intermediate material is reduced below 3%.” The amendment is supported in the specification at, for example, page 5, line 28-page 6, line 2. As amended, Applicants respectfully submit that one of ordinary skill in the art would appreciate that Claim 1 clearly illustrates that at the end of a cooking step, the intermediate material has a water content that is reduced below 3%.

In response to the Patent Office’s assertion that there is no antecedent basis in Claim 1 for “cooking,” Applicants have amended independent Claim 1 to recite, in part, cooling the intermediate material to form a glassy amorphous solid that has improved transparency compared to a glassy amorphous solid in which the acidic component has been added after a cooking step. The amendment is supported in the specification at, for example, page 5, line 28-page 6, line 11. As amended, Applicants respectfully submit that there is proper antecedent basis for “a cooking step,” in independent Claim 1.

In response to the Patent Office’s assertion that Claim 3 is indefinite for not reciting when and to what the vacuum is applied, Applicants have canceled Claim 4 and have amended Claim 3 to recite, in part, a method comprising applying a vacuum to an evaporator during the cooking step to assist in removing water to reach a desired final water content of the intermediate material. The amendment is supported in the specification at, for example, page 3, lines 13-22.

As amended, Applicants respectfully submit that Claim 3 specifically identifies when and to what the vacuum is applied and, as such, complies with 35 U.S.C. § 112, second paragraph.

For at least the reasons discussed above, Applicants respectfully submit that Claims 1 and 3 are in compliance with 35 U.S.C. § 112, second paragraph and are in a position for allowance.

Accordingly, Applicants respectfully request that the rejection of Claims 1 and 3 under 35 U.S.C. §112, second paragraph be withdrawn.

In the Office Action, Claims 1, 3-6 and 8-12 are rejected under 35 U.S.C. §103(a) as being unpatentable over European Patent No. 1 151 673 to Rivier (“*Rivier*”). Applicants believe this rejection is improper and respectfully traverse it for at least the reasons set forth below.

Independent Claim 1 is directed, in part, to a method comprising: (i) forming a liquid starting material comprising water, the at least one acidic component, and the at least one sugar alcohol which is not a monosaccharide sugar alcohol; (ii) evaporating water from the liquid starting material under conditions at which the acidic component does not cause significant hydrolysis of the sugar alcohol to dissolve the acidic component in the liquid and to remove at least part of the water to form an intermediate material, wherein the evaporating is carried out at a temperature that does not exceed 145°C; and (iii) cooling the intermediate material to form a glassy amorphous solid that has improved transparency compared to a glassy amorphous solid in which the acidic component has been added after a cooking step, wherein the water content of the intermediate material is reduced to below 3%. In contrast, Applicants respectfully submit that *Rivier* is deficient with respect to the present claims.

As taught by Applicants’ specification, hard candy is generally made by a process in which a mixture of the sugar or sugar alcohol and water is heated, generally under vacuum, at a temperature of about 130-150°C. The resulting mixture can still be worked and formed into confectionery products as desired and on cooling forms a glassy amorphous solid with a water content of less than 3%. Hard candy generally contains other ingredients some of which can be acidic.

Sugar alcohols which are not monosaccharide sugar alcohols show some susceptibility to acid hydrolysis, and so acid components are conventionally added towards the end of or after heat treatment or cooking. However, hydrolysis of the sugar alcohol can still occur which in turn results in a sticky, hygroscopic product and/or crystallization of the candy. In addition, by the time that the acid component is added, the water content of the mixture has been reduced through

evaporation, generally to around 2% or less. The acids are conventionally added as powder rather than pre-dissolved in water to avoid introducing additional water which would remain in the final composition, possibly with detrimental effects on the quality of the final product, but this has the consequence that dissolution of the acid may be difficult or incomplete. As a result of these factors, there is a tendency of the hard candy to be a opaque.

One example of a commercially available sugar alcohol commonly used as a sugar substitute is Isomalt, which is made by enzymatic rearrangement of sucrose followed by hydrogenation. Isomalt is a mixture of the isomers 1-O- α -D-glucopyranosyl-D-mannitol dehydrate and 6- O- α -D-glucopyranosyl-D-sorbitol. In the processing of Isomalt into hard candy, flavor, color and citric acid are added at the cooling stage of the process after cooking is complete.

In accordance with the present invention, it has been surprisingly found that acidic component(s) which have conventionally been observed to hydrolyze the sugar alcohol can be added at the start of the process for the manufacture of a hard candy provided that conditions are used in the process under which the acid does not hydrolyze the sugar alcohol. Generally this will involve the use of a vacuum evaporator to reach the desired final moisture content at a temperature which is low enough to avoid hydrolysis of the sugar alcohol. As a result, the problems referred to above are alleviated, and the resulting hard candy shows improved transparency.

When the acidic component is added at the beginning before evaporation (*i.e.*, cooking) according to the present invention, transmission for a hard candy has been found to be consistently greater than with a comparable product made by a method using addition of acidic ingredients during cooling (*i.e.*, after cooking). See, specification, Example 1 and Table 1. Applicants' Comparative Example 2 shows that, when the acid is added during cooling after cooking and vacuuming, the candy product is more opaque than that of Example 1 where the acidic component is added before cooking.

Moreover, the evaporation is carried out at a temperature not exceeding 148°C, more preferably, not exceeding 145°C. Thus, the present invention relates to a method for preparing a hard candy, which includes at least one acidic component and which shows improved transparency. Such a hard candy is made by forming a liquid starting material comprising at least one sugar alcohol which is not a monosaccharide sugar alcohol, water and the acidic

component; heating under conditions not above 148°C, preferably not above 145°C, at which the acidic component does not cause significant hydrolysis of the sugar alcohol to dissolve the acidic component in the liquid and remove at least part of the water; and cooling to form the hard candy with a final water content of an intermediate material below 3%. In contrast, Applicants respectfully submit that *Rivier* is deficient with respect to the present claims.

Applicants respectfully submit that the skilled artisan would have no reason to modify *Rivier* to arrive at the presently claimed subject matter because *Rivier* teaches away from the present invention. As detailed in an Affidavit (“*Affidavit*”) previously submitted by Applicants in a related application, U.S. Application No. 11/314,042, and attached hereto as Exhibit A, *Rivier* (referred to in the *Affidavit* as “*Rivier II*”) teaches a conventional process for producing confectionery products wherein acidic components are added after cooking. Specifically, *Rivier* teaches that a mixture of 80 Kg of isomalt, 10 Kg of maltitol syrup and 10 Kg of water is cooked under 60% vacuum until reaching a cooking temperature of 155°C. Subsequently, the resulting cooked mass is flavoured, coloured, and acidified and cooled down at 70°C. See, *Rivier*, Example 1. As detailed in the *Affidavit*, addition of acidic component(s) post-cooking will not result in a glassy amorphous solid having an improved transparency as evidenced by the transmission levels required by a product produced by a manufacturing process of the present invention. Similarly, a method wherein the acidic components are added post-cooking is in direct contrast to the method of the present invention in which the acidic components are added before cooking. Because *Rivier* adds the acidic components of the hard candy after cooking, *Rivier* teaches away from the present claimed subject matter including a method of making a hardy candy product in which the acidic components are added prior to a cooking stage. As such, Applicants respectfully submit that the skilled artisan would have no reason to modify *Rivier* to arrive at the present claims.

However, even if modification of *Rivier* is proper, Applicants also submit that *Rivier* fails to disclose or suggest every limitation of presently amended independent Claim 1 and, therefore, dependent Claims 3-6 and 8-12 that depend therefrom. For example, *Rivier* fails to disclose or suggest forming a liquid starting material comprising water and at least one acidic component, and evaporating water from the liquid starting material under conditions at which the acidic component does not cause significant hydrolysis of the sugar alcohol as required, in part, by Claim 1. Instead, and as described above and in the *Affidavit*, *Rivier* teaches a conventional

process for producing confectionery products wherein acidic components are added after cooking. See, *Rivier*, [0059], [0060], Example 1 and *Affidavit*. As discussed previously, Applicants have shown in comparative Example 2 that when the acid is added during cooling after cooking and vacuuming the final candy product is more opaque than that made according to the claimed method (Example 1), which involves the acidic component added before cooking the liquid starting material. Because *Rivier* discloses a method of making a hard candy wherein acidic components are after cooking, *Rivier* cannot disclose a method wherein a liquid starting material comprising water, at least one acidic component and at least one sugar alcohol is formed as required, in part, by the present claims.

Moreover, Applicants respectfully disagree with the Patent Office's assertion that "*Rivier* discloses preparing a confectionery product from a starting liquid composition including water, citric acid and sorbitol, maltitol, isomalt or a mixture of these polyols." See, Office Action, page 2, lines 20-22 (emphasis added). Instead, and as described above, *Rivier* cannot teach a starting liquid composition having citric acid because *Rivier* teaches a conventional process for producing confectionery products wherein acidic components are added after cooking. See, *Rivier*, [0059], [0060], Example 1 and *Affidavit*. Indeed, Applicants have described comparative examples that show the differences in transparency of the final candy product made by processes involving adding acid to the liquid mixture before a cooking step (claimed process) versus adding acid to the cooked composition during cooling and vacuuming the product (*Rivier*). Consequently, Applicants' claimed process is distinguishable from *Rivier*, and the finished product of *Rivier* would not have improved transparency in accordance with the present invention. For at least the reasons discussed above, Applicants respectfully submit that Claims 1, 3-6 and 8-12 are novel, nonobvious and distinguishable from the cited reference.

Accordingly, Applicants respectfully request that the rejection of Claims 1, 3-6 and 8-12 under 35 U.S.C. §103 be withdrawn.

In the Office Action, Claims 1, 3-6 and 8-12 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,154,867 to Aldrich et al. ("Aldrich") or U.S. Patent No. 3,738,845 to Liebrand ("Liebrand"), either in view of *Rivier*. Applicants believe this rejection is improper and respectfully traverse it for at least the reasons set forth below.

Applicants respectfully submit that, even if combinable, the cited references are deficient with respect to the present claims because the cited references, either alone or in combination,

fail to disclose each and every limitation of the present claims. For example, *Aldrich* is deficient with respect to independent Claim 1 for at least the following reasons: 1) *Aldrich* fails to disclose or suggest evaporating water from a liquid starting material under conditions at which the acidic component does not cause significant hydrolysis of the sugar alcohol to dissolve the acidic component in the liquid and to remove at least part of the water to form an intermediate material, wherein the evaporating is carried out at a temperature that does not exceed 145°C because, in all of the Examples, *Aldrich* teaches dissolving acidic components in a liquid using temperature of 330-335°C (about 165°C to 167°C); 2) *Aldrich* teaches away from using other acids such as citric acid, which are suitable in the present invention; 3) *Aldrich* discloses the use of sorbitol (e.g., a monosaccharide sugar alcohol) as the preferred sugar alcohol whereas, in the present invention, the sugar alcohol used is not a monosaccharide sugar alcohol; 4) the acid is not added at the start of the process (see, Example 1 where malic acid is added later in the processing) as it is in the present invention; and 5) *Aldrich* is wholly silent on the water content of the final product.

In addition to the above-mentioned differences, the objects of the two inventions are completely different. The object of *Aldrich* is to improve the flavor whereas an object of the present invention is to obtain a product having improved transparency. *Aldrich* states at column 1, lines 40-44, “[s]urprisingly, in accordance with the present invention, the above flavor problems associated with the use of citric acid in combination with hydrogenated starch hydrolysates and sorbitol has been resolved by replacing the citric acid with malic acid.”

Liebrand is also deficient with respect to the present claims for at least the following reasons: 1) *Liebrand* fails to disclose or suggest evaporating water from a liquid starting material under conditions at which the acidic component does not cause significant hydrolysis of the sugar alcohol to dissolve the acidic component in the liquid and to remove at least part of the water to form an intermediate material, wherein the evaporating is carried out at a temperature that does not exceed 145°C because *Liebrand* teaches evaporating water at a temperature of “at least 300°F” and up to 350°F (about 149°C to about 177°C); and 2) *Liebrand* discloses the use of sorbitol (e.g., a monosaccharide sugar alcohol) as the preferred (and only) sugar alcohol whereas, in the present invention, the sugar alcohol used is not a monosaccharide sugar alcohol.

Further, *Rivier* is deficient with respect to the presently claimed subject matter for at least the reasons set forth above. Moreover, *Rivier* is also deficient with respect to the present claims

because *Rivier* fails to disclose or suggest evaporating water from a liquid starting material under conditions at which the acidic component does not cause significant hydrolysis of the sugar alcohol to dissolve the acidic component in the liquid and to remove at least part of the water to form an intermediate material, wherein the evaporating is carried out at a temperature that does not exceed 145°C as required, in part, by the presently claimed subject matter. Instead, *Rivier* teaches cooking its hard candy product at a temperature of 155°C, which is clearly higher than the temperature of 145°C allowed by process of the present invention. Moreover, because *Rivier* fails to disclose or suggest a liquid starting material having an acidic component added prior to cooking, *Rivier* cannot disclose or suggest evaporating water from a liquid starting material under conditions at which the acidic component does not cause significant hydrolysis of the sugar alcohol to dissolve the acidic component in the liquid and to remove at least part of the water to form an intermediate material, wherein the evaporating is carried out at a temperature that does not exceed 145°C.

Because *Aldrich*, *Liebrand* and *Rivier* are all deficient with respect to the present claims, Applicants respectfully disagree with the Patent Office's assertion that it would have been obvious to combine the cited references to arrive at the present claims. In contrast, Applicants respectfully submit that the skilled artisan seeking to improve the transparency of a hard candy would have no reason to combine the cited references to arrive at the present claims because they fail to disclose or suggest every element of the present claims and actually teach away from the present claims.

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For at least the reasons discussed above, Applicants respectfully submit that Claims 1, 3-6 and 8-12 are novel, nonobvious and distinguishable from the cited reference.

Accordingly, Applicants respectfully request reconsideration of the above-identified patent application and earnestly solicit an early allowance of same.

Respectfully submitted,

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